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THE THIRD WAVE METANOIA:
Breaking the Command and Control Paradigm

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements for the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract of

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As the United States military enters the 21st century, the exponential advances of the Information Age will fundamentally transform the nation's operational warfighting capabilities, not through technical innovation, but rather in the dynamic transformation of command and control practices and organizational structures.

Historically, decisive technological advances are a temporary phenomenon. Therefore, the state that is able to leverage technical advances with innovative command and control methods will accrue long-term operational dominance. The American private sector has begun to shed its organizational blinders and has experienced the initial stage of a dramatic expansion in productivity and competitive advantage. Confronted with a challenging range of military operations, the United States Army must seek the "high ground" of innovation, incorporating command and control and organizational changes that will ensure American dominance in the Information Age battlespace.

The re-engineered combat arms brigade would afford an operational commander with an agile and lethal core warfighting organization. Liberated from the Cold War divisional hierarchy and empowered with a command-by-influence system, the brigade would enable the operational commander to dominate the battlespace through a rapid decision cycle, reduction of operational pauses, and precision strikes against enemy unit cohesion. The absence of a divisional framework would empower the combatant commander to align forces under a single functional commander. The lean command structure would promote a synergistic massing of combat power on a horizontal battlespace, unachievable on the contemporary geographically segmented battlefield. The local decision thresholds and streamlined organizational hierarchy of the combat arms brigade provide the operational commander with an effective means of reducing nonlinear uncertainty. The self-synchronizing brigade fosters the transition from an Industrial Age strategy of attrition to an Information Age strategy of shock.

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Military leaders throughout history have exercised the function of command and control to synchronize their activities in relation to space, time, and forces.¹ Command and control enables leaders to conduct coordinated operations despite the inherent friction in war that Carl Von Clausewitz describes as "the factor that distinguishes real war from war on paper."² Revolutions in military affairs have often focused solely on technological advances. Historically, decisive technological advantages are a temporary phenomenon. Therefore, the state that is able to leverage technical advances with innovative command and control methods will accrue long-term operational dominance.³ Innovative command and control practices coupled with technology offer expanded capabilities to the operational commander. Successful private sector Information Age trials provide sound models for change within the proposed military framework in Joint Vision 2010.

The Third Wave: The Revolutionary American Economy

Emerging from the Second World War, the American economy then in the Industrial Age perfected the centralization model. Rigid, hierarchical layers of management were established to guarantee predictable performance. The organizational culture of American industry embraced the post-war mental model for success, implementing only slow incremental changes despite dramatic productivity and earnings declines in the 1970's and 1980's.

¹ Milan Vego, On Operational Art (4th Draft), (Newport, RI: The United States Naval War College, September, 1999), 269.

² Michael Howard and Peter Paret, On War, Indexed ed. (Princeton: Princeton University Press, 1989), 119.

³ Martin L. Van Creveld, Command in War (Cambridge: Harvard University Press 1985), 231.

One of America's first major conversions from a Second Wave to a Third Wave corporation was General Electric. Reflective of the Cold War military, GE was a mammoth organization, which relied on centralized control. While still at the top of its industry, GE recognized the need to break the industrial paradigm. GE undertook a strategic restructuring, eliminated multiple layers of entrenched management and focused on its core markets.⁴ The corporation's renewed situational awareness and organizational behavior allowed GE to create superior value for its customers and dominate the competitive space. GE has transitioned from a stagnant industrial culture to one that engages change in an adaptive process, able to cope with any market trend.⁵

At Microsoft, Bill Gates established two visionary principles that foreshadowed the responsive management methods of the Information Age: (1) radical autonomy and; (2) minimal top-down coordination.⁶ The "flattened hierarchy" of the Microsoft organizational structure proved to be highly flexible in responding to the rapidly changing software industry. Microsoft employees, not shackled by the traditional centralized management system, were empowered to make critical decisions and to freely share information both horizontally and vertically within the organization. In essence, Microsoft became a template for a "learning organization," incorporating Peter Senge's five disciplines within the corporation: (1) systems thinking; (2) personal mastery; (3) mental models; (4) building shared vision and; (5) team learning.⁷ Microsoft's management approach has fostered long-term growth and risk suppression by ensuring constant competitive awareness. The corporation is able to retain a steady growth curve, in sharp contrast from the typical fluctuating earning/product cycle.

Although GE and Microsoft represent radically different industries, both have proved successful in the Third Wave by establishing competitive ecosystems, which generate high levels of awareness.⁸ Information is the fuel that allows these innovative organizations to construct rapid and proficient decision cycles. Decentralized

⁴ Gordon R. Sullivan and Michael V. Harper, Hope is not a Method (New York: Broadway Books 1996), 34.

⁵ Dennis J. Reimer, "The Army After Next: Revolutionary Transformation," U.S. Army War College Parameters, Spring 1999, 42.

⁶ Douglas A. Macgregor, Breaking the Phalanx (Westport: Praeger 1997), 34.

⁷ Peter M. Senge, The Fifth Discipline (New York: Currency Doubleday 1994), 6-10.

⁸ David S. Alberts and others, Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd ed. (Washington: NDU Press, 1999), 36-37.

organizational structures empower employees familiar with the market to execute critical decisions, rendering Industrial Age management layers obsolete. American industry has only begun to recognize the vast potential inherent in the self-synchronizing, information leveraged organizations of the 21st Century.

The American Military Enters The Information Age

*"Neither our imagination nor vision in the years since WWII had given us a combat capability that would provide the margin of advantage that we needed to win decisively and quickly."*⁹ LTG James Gavin

The innovative management practices of Information Age corporations provide fascinating case studies, but the issue is whether the lessons of the private sector are applicable to American military forces. Charged with providing global deterrence and with the responsibility to fight and win the nation's wars, the military services must be ready to respond immediately with an effective force.¹⁰ Reorganization of the United States military affords relatively little room for error, as leaders balance contemporary demands against the future organizational framework. As the services enter the Information Age, fundamental command and control practices and organizational structure must be modified to adequately leverage advanced capabilities.

Lieutenant General James Gavin eloquently remarked on the resistance to imagination and innovation that is often entrenched in organizations that have experienced recent success. The Cold War military, which dominated the Gulf War battlefield, will be incapable of responding to the multi-spectrum, nonlinear battlefield of the Information Age. Historically, military progress lags behind that of the civilian sector. Two factors account for this transitional gap: (1) military culture (the burden of proof falls on the advocate) and; (2) the urgency of the contemporary mission.¹¹ The Cold War processes for incremental transition are not practical in the fluid environment of the Information Age. The American military must be able to rapidly adapt to change like the entrepreneurial organizations in the private sector.

⁹ Douglas A. Macgregor, Breaking the Phalanx (Westport: Praeger 1997), 234.

¹⁰ Joint Chiefs of Staff, Joint Vision 2010 (Washington, D.C.), 4.

¹¹ Douglas A. Macgregor, "Command and Control for Joint Strategic Actions," Joint Forces Quarterly, Autumn/Winter 1998-1999, 27.

Aware of the complexity of the future battlespace, the military services have mounted individual efforts within the JV 2010 framework to profit from the technical opportunities of the Third Wave. Technology leveraging efforts such as the Navy's Network Centric Warfare, the Army's Force XXI, and the Joint Global Command and Control System represent attempts to enhance future force capabilities. The cornerstone of the proposed force structures lie in advanced sensors, grids, and platforms. Remarkably, the importance of command and control continues to be overlooked, while service efforts remain fixated on technology. However, Moore's Law, which states that semiconductor performance doubles every 18 months, implies that technology will continue to rapidly expand.¹² Service efforts which promote an architecture of technological advances (point in time) built on the contemporary command and control foundation will fail to recognize the full potential of Information Age warfare. General Electric and Microsoft achieved success not solely through information technology, but in the co-evolution of innovative management practices and organizational structures, which can rapidly adapt to the by-products of Moore's Law. Technology alone will not bring about a revolution in military affairs.¹³

Force XXI

*"We have met the enemy and he is us."*¹⁴

In March 1994, the Army Chief of Staff General Gordon R. Sullivan announced the establishment of the service's vision for future warfighting – Force XXI. Focused on the digitized battlefield, Force XXI incorporates experimentation (weapon platforms, organizational structure, doctrine) for both the heavy (mechanized and armor) and light components of the Army. Despite efforts to revolutionize Army ground operations, Force XXI has failed to break the Cold War paradigm and represents only incremental advances (weapon platforms and communication systems) integrated within the service's existing organizational structure. Force XXI has reinforced the Cold War centralized command and control practices and the stagnant

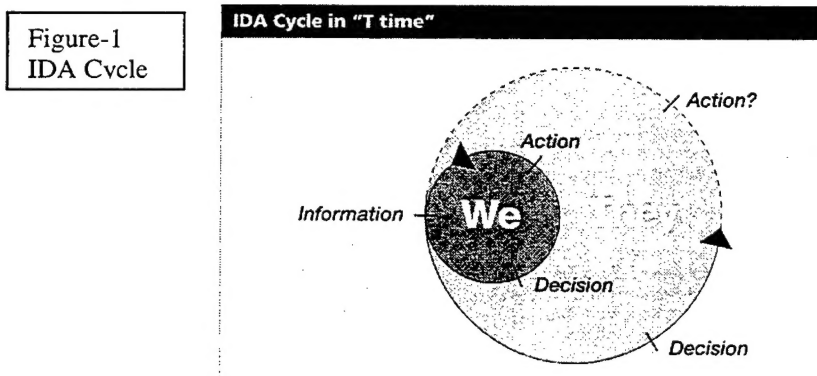
¹² David S. Alberts and others, Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd ed. (Washington: NDU Press, 1999), 247.

¹³ Douglas A. Macgregor, Breaking the Phalanx (Westport: Praeger 1997), 4.

¹⁴ Peter M. Senge, The Fifth Discipline (New York: Currency Doubleday 1994), 54.

divisional model.¹⁵ To recognize the true potential of Force XXI, the Army's senior leadership must allow the experimentation to break out of the established military culture.

Similar to the Navy's Network Centric Warfare, Force XXI is centered around shared battlespace awareness and the common operational picture. Division and brigade commanders will be aware of actions, locations, and readiness of units across echelons and along functional components within the combat team.¹⁶ Hundreds of platforms on the battlefield will simultaneously act as sensors within the grid/network, relaying real-time information to the headquarters element. In theory, the common operating picture and instantaneous information will increase the speed of command.



The Force XXI template stresses the compression of the commanders decision cycle or IDA cycle (information – decision – action). By dominating the enemy in the dimension of time, the Force XXI commander retains a shorter IDA cycle than the enemy (figure-1) and pursues victory through an aggressive operational tempo.¹⁷ Exploitation of the dimension of time will be critical in future operations, however the Force XXI template incorporates self-induced friction within the IDA cycle by retaining the current hierarchical command structure.

¹⁵ Macgregor, Command and Control for Joint Strategic Actions, 27.

¹⁶ David S. Alberts and others, Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd ed. (Washington: NDU Press, 1999), 135.

¹⁷ Ajay Singh, "Time: The New Dimension in War," Joint Forces Quarterly, Winter 1995-1996, 59-61.

The Roman Legion: Innovative Blueprint for Force XXI

*"I believe we are in a revolution in methods of commanding soldiers and units in battle similar to the one that took place in the 1920's with the wireless radio and the track-laying technology."*¹⁸ General Frederick M. Franks Jr.

The Roman Legion embodies images of Caesar and centurions. However, the unique aspect of the Roman Legion was its novel approach towards the difficulties of battlefield control. By establishing a flexible organizational framework, standardized tactics, and empowering subordinate commanders to exercise battlefield initiative, the Legion had no peer on the battlefield.¹⁹ While the Roman Legion did not hold great technical superiority over its adversaries, qualitative advantage was gained through the decisive employment of command and control practices. Ancient Rome had crafted a blueprint for America's technology dominant 21st century Army.²⁰

Force XXI offers tremendous technical capabilities for the warfighters of the United States Army. Yet to fully leverage these technical advances, Force XXI must break the entrenched mental models of the military culture. Foremost, Force XXI must aggressively incorporate "command by influence" to achieve the JV 2010 vision of dominant maneuver. The Army has made significant strides in encouraging battlefield initiative within the actions of subordinates through the use of the commander's intent. The communication of the commander's broad vision both horizontally and vertically, transmits a purpose, method, and endstate that junior leaders can base critical decisions on when the stated plan transforms upon contact with the enemy. Clausewitz provided unique insight on the commander's intent stating, "[w]hat is required is a sense of unity and power of judgement raised to a marvelous pitch of vision."²¹ The intent statement provides for the element of unity of effort.

¹⁸ Frederick M. Franks Jr., "Full-Dimensional Operations: A Doctrine for an Era of Change," U.S. Army Command and General Staff College Military Review, December 1993, 6.

¹⁹ Martin L. Van Creveld, Command in War (Cambridge: Harvard University Press 1985), 45-47.

²⁰ Macgregor, Breaking the Phalanx, 1.

²¹ Michael Howard and Peter Paret, On War, Indexed ed. (Princeton: Princeton University Press, 1989), 87-88.

Historically, command has been conducted by direction, by plan, or through influence.²² Despite the focus on the commander's intent within contemporary Army, operations are executed utilizing the highly centralized model of command-by-plan. Modern western militaries have relied on strict organization to overcome uncertainty and insufficient information on the battlefield.²³ The theme "centralized planning, decentralized execution" falsely implies that the modern Army executes operations under command-by-influence. The orchestration of units and synchronization of events dominates conventional planning; hence the commander's intent statement is paid cursory attention. Centralized command and control has manifested itself in Army operations through the realities of political sensitivities, risk management (cost-benefit analysis), unit specialization, organizational structure, and the insatiable demand for information.²⁴ Windows of battlespace opportunity are brief, requiring subordinate commanders to recognize immediately and rapidly exploit.²⁵ Reflecting a modern day albatross, the contemporary command-by-plan method impedes the speed of subordinate commander's decision cycles.

The Army's Force XXI template does not transition the service forward within the Information Age to a command-by-influence structure, rather it reverts to the oldest method, command-by-direction.²⁶ Force XXI has leveraged the Information Age to provide senior commanders with a digitized vantage point from which to direct the entire battle. The Army's espoused values and cultural assumptions towards operational control are readily apparent within the Force XXI structure, a reliance on centralized decision making rather than the unpredictable actions of subordinates executing the commander's intent.²⁷ This is not to say that the information network and technological advances within Force XXI are not beneficial to the future force

²² Thomas J. Czerwinski, "Command and Control at the Crossroads," Joint Forces Quarterly, Autumn 1996, 121.

²³ Martin L. Van Creveld, Command in War (Cambridge: Harvard University Press 1985), 264-266.

²⁴ *Ibid.*, 236-237.

²⁵ David M. Keithly and Stephen P. Ferris, "Auftragstaktik, of Directive Control, in Joint Combined Operations," U.S. Army War College Parameters, Autumn 1999, 125.

²⁶ Czerwinski, Command and Control at the Crossroads, 122.

²⁷ *Ibid.*, 123.

structure, rather that these Information Age capabilities should be paired with equally capable command and control methods.

The Orwellian command process within Force XXI fails Martin Van Creveld's test for command performance: "[c]onfronted with a task and having less information than is needed a military organization may...increase its information processing capability...leading to the multiplication of communication channels and to an increase in the size and complexity of the central directing organ."²⁸ The American military experience in Vietnam provides a parallel to the current Force XXI model. Prior to the nation's involvement in Vietnam, great technological advances in communications afforded significant operational advantages for the United States Army. However, the technological advantage was negated by the "information pathology" spurred by the massive information demands of senior commanders.²⁹ The requirements for information produced immense quantities of data, often causing system bottlenecks. Despite modern technology, the American Army had a longer decision cycle than the less sophisticated North Vietnamese.³⁰ Technology and commanders relentless demands for information proved to be a disease not the panacea.

Assuming the premise that the chief objective of any command and control system is unity of effort, the Force XXI concept should incorporate command-by-influence. Operating within a chaotic environment, a commander's greatest challenge is to obtain an adequate degree of certainty.³¹ Through establishment of a robust commander's intent, senior leaders would be willing to accept a greater degree of uncertainty (lack of information) at the upper echelons, while simultaneously reducing the uncertainty for subordinate commanders. Command-by-influence distributes degrees of uncertainty throughout the organization, directing specifically tailored forces with local situational awareness to complete an assigned task.³² The security of the whole is assured by the certainty of the parts. Command-by-influence distributes risk and provides unity of effort.

²⁸ Van Creveld, 248-249.

²⁹ Ibid., 251.

³⁰ Ibid., 266.

³¹ Peter M. Senge and others, The Dance of Change (New York: Currency Doubleday 1999), 336-340.

³² Czerwinski, Command and Control at the Crossroads, 125.

The Force XXI common operational picture will provide volumes of explicit information (position of forces, resource levels, weather, and terrain) on the battlespace.³³ However, the eternal information requirement – the independent will of the enemy – will remain a mystery. A command-by-influence system coupled with the Force XXI infrastructure would enable subordinate commanders to self-synchronize to a given situation, rather than relying on a hierarchical driven plan with limited situational awareness. Aware of the commander's intent, subordinates capable of self-synchronization will dramatically increase the speed of command and reduce operational pauses. Unable to counter the rapid operational tempo of the Army commander, the enemy will experience a decision cycle "domino effect," crippling the unit's ability to conduct future operations.³⁴ Self-synchronization of units within the battlespace embodies the essence of the Information Age where, as Peter Drucker states, "knowledge workers will have to learn to manage themselves."³⁵

Furthermore, the "empty battlespace" of modern warfare will demand that American Army units be dispersed over a significant expanse of territory. The survival of these small, maneuverable and highly lethal combat units will depend on the ability of commanders to rapidly react to the enemy. The current Force XXI command and control process places the subordinate (local) commander at a distinct disadvantage. The senior commanders' decision cycle will range somewhere between "prompt" and "paralysis by analysis."³⁶ Clearly, a Force XXI model that would incorporate command-by-influence would empower the local commander and provide Army combat units the most responsive speed of command.

Augmented with a command-by-influence process, Force XXI would provide operational commanders with the inherent combat force flexibility required within the vast spectrum of conflict that the nation will encounter during the Information Age. The greatest battle for the Army will be its own institutional battle with underlying cultural assumptions. Command-by-influence has a significant historical military precedence (Roman Legion,

³³ Alberts and others, 128.

³⁴ Singh, 61.

³⁵ Peter F. Drucker, Management Challenges for the 21st Century (New York: Harper Business 1999), 163.

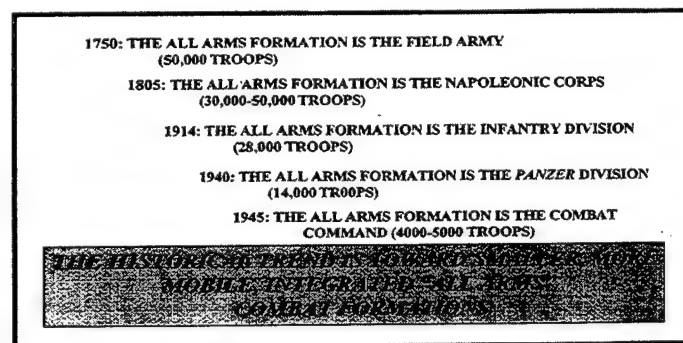
³⁶ Paul T. Harig, "The Digital General: Reflections on Leadership in the Post-Information Age," U.S. Army War College Parameters, Autumn 1996, 138.

Moltke-Prussian Army, Guderian-Panzergruppe 2, Gavish-Israeli Army) and has provided a sound management framework for private sector organizations.³⁷ One of the American Army's greatest strengths is the talented corps of leaders within the institution. Senior leadership continues to hold the reins of change due to fears of political sensitivities, conflict escalation, and situational control. In reality, subordinate commanders and junior leaders execute flawlessly on a daily basis in challenging situations through their initiative, intuition, and perceptive situational awareness. Command-by-influence would recognize and leverage this unique American asset. The linear and nonlinear battlespace of the Third Wave demands this command and control method.

The Combat Arms Brigade: Architecture of the Future

The Force XXI concept is built on the Cold War foundation of the Army division. The entrenched mental model within the Army reflects the institutional satisfaction with the divisional command and control framework. The division organizational structure was designed for the mass mobilization of Industrial Age war.³⁸ However, a division's hierarchical echelons of command generate organizational friction within the decision cycle and represent obstacles to the flexibility required of forces in the Information Age battlespace. The Army must provide the architectural vision for a combat arms formation that can leverage the technical advances of Force XXI and the unique flexibility of command-by-influence.

Figure-2
Force Trend



³⁷ Van Creveld, 194, 199, 270.

³⁸ Macgregor, Command and Control for Joint Strategic Actions, 30.

Historically, as technical advances and enhancements in command and control have occurred, combat organizations (figure-2) have corresponded by becoming smaller and enhancing mobility.³⁹ The Army should break the Cold War command paradigm by retiring the divisional model and re-engineering the services warfighting organization around a combined arms brigade. The institutional transition to the combat arms brigade or combat group as advocated by Colonel Douglas A. Macgregor eliminates the overarching divisional echelons.⁴⁰ Organizing the brigade as a combat arms team incorporates unit self-sufficiency. In response to the increasingly lethal battlespace, the combined arms brigade could disperse into lean, agile units capable of sustained operations in a “high tempo” environment. The streamlined organizational structure of the Force XXI combat arms brigade coupled with a command-by-influence system will revolutionize maneuver warfare, transitioning the Army from a strategy of attrition to a strategy of shock.

Dominant Maneuver

America’s adversaries are keenly aware of the lessons of the Gulf War. Future enemy formations will be divided into smaller units that will emphasize the defense and control large areas of territory. The “empty battlefield” approach acknowledges American precision engagement capabilities.⁴¹ Adversaries view time as the critical factor when opposing the United States. The degree of patience and willingness to sacrifice displayed by an enemy could lead to a protracted conflict and ultimately defeat America’s will to commit forces to the conflict.⁴²

The combat arms brigade will strike an operational balance of precision maneuver and precision firepower. Army combat elements will maneuver to areas of positional advantage (time and space) that place the enemy at a disadvantage.⁴³ Executing tasks with minimal hierarchy and defeating the enemy’s decision cycle through

³⁹ Douglas A. Macgregor, Breaking the Phalanx (Westport: Praeger 1997), 53.

⁴⁰ Ibid., 74.

⁴¹ Robert J. Bunker, “Advanced Battlespace and Cybermaneuver Concepts: Implications for Force XXI,” U.S. Army War College Parameters, Autumn 1996, 110.

⁴² Peter F. Drucker, Management Challenges for the 21st Century (New York: Harper Business 1999), 49.

⁴³ Douglas A. Macgregor, Breaking the Phalanx (Westport: Praeger 1997), 37.

command-by-influence; the combat arms brigade will aggressively strike at centers of gravity and decisive points. Unable to successfully establish "area control" the enemy must abdicate or attack. Enemy offensive operations will enable the lean, autonomous Army forces to quickly transition from the strategic offensive to the tactical defense.⁴⁴ The transition to the defense reflects the American desire to minimize the loss of ground forces, inherent in Clausewitz's assertion "the defensive form of warfare is intrinsically stronger than the offensive."⁴⁵

The transition of maneuver warfare from the Industrial Age attrition based strategy towards an Information Age strategy of shock demands a comprehensive change in the Army's command and control system. The autonomous mobility, instantaneous decision cycles, and accelerated tempo that characterize the future battlespace are not attainable with the current incremental command and control alterations offered in the Force XXI concept. Major General Robert H. Scales concept of the Information Age blitzkrieg rapidly defeats enemy forces through a balanced application of precision maneuver and precision firepower.⁴⁶ The Army's ability to execute this revolutionary blitzkrieg will rest solidly on the institution's ability to implement viable Third Wave command and control structures.

The Operational Commander: Enhanced Combat Power

*"Give me a lever long enough...and single-handed I can move the world."*⁴⁷ Archimedes

As the United States Army incorporates Information Age advanced technology and efficient command and control systems, operational commanders will be afforded expanded force capabilities, which will enhance the nation's "imperative of engagement."⁴⁸ Recent American military actions have relied heavily on a single-dimension approach to warfare - precision strike operations. While precision strikes are a potent instrument of

⁴⁴ Robert H. Scales, Jr., "A Sword with Two Edges: Maneuver in 21st Century Warfare," U.S. Army War College Parameters, Spring 1999, 52.

⁴⁵ Michael Howard and Peter Paret, On War, Indexed ed. (Princeton: Princeton University Press, 1989), 358.

⁴⁶ Scales, 52.

⁴⁷ Peter M. Senge, The Fifth Discipline (New York: Currency Doubleday 1994), 13.

⁴⁸ Joint Chiefs of Staff, National Military Strategy of the United States of America (Washington, D.C.: September 1997), 6.

war, firepower alone cannot achieve the political objectives required for victory.⁴⁹ However, the combat arms brigade enables a combatant commander to seize and control territory through dominant maneuver. The rapid infusion of state of the art technology (precision guided munitions, communications) within the battlespace will present significant obstacles to American forces. Despite the eventual reduction of the United States technical buffer, operational commanders will use agile, responsive command and control methods that represent the premiere force multiplier in achieving enhanced combat power. The self-synchronization forces within the 21st century combat arms brigades represent an Information Age lever for the operational commander.

The Army combat arms brigade model provides the combatant commander with a unique asset for integrating within the theater engagement plan or as a flexible deterrent option. The re-engineered brigade would offer the commander an enhanced deterrence instrument in the effort to shape the theater security environment. Operational commanders orchestrating regional training exercises can demonstrate the combat arms brigade's rapid strategic deployability and immediate "off the ramp" warfighting capabilities to allies and adversaries. The brigade would be operationally self-sufficient and not require the massive American logistical footprint that represents a source of contention in specific regions.⁵⁰ Stripped of the divisional hierarchy, the combat arms brigade deployed to an impending crisis area can without delay assume a broad defensive posture. Adversaries confronted with the rapid power projection of widely dispersed, lethal ground combat elements must re-examine their net assessment to strike American interests.

The Functional Joint Task Force

Currently, one of the cultural legacies that restricts an operational commander's freedom of action is the various service component headquarters that become integrated within a joint task force (JTF). As a JTF is formed, allocated divisions are provided areas of responsibilities that span vertically across the close/deep/rear battlefield framework. The imposition of the division hierarchy upon the JTF creates a complex (multi-echelon)

⁴⁹ Scales, 48.

⁵⁰ D. Sean Barnett and James S. Thomason, "Flexible Presence in the 21st Century," Joint Forces Quarterly, Autumn/Winter 1998-1999, 10.

command and control structure that impedes the flow of information.⁵¹ Furthermore, since each divisional commander is involved with operations in the close/deep/rear arenas, synergistic effects are not realized on the JTF level.

The introduction of combat arms brigades into a JTF would allow the operational commander to discard the traditional vertical/divisional segmented battlefield. A horizontal battlespace framework would enable the JFC to assign a single functional commander to conduct operations within each battle area: close/deep/rear.⁵² The joint force land component commander (JFLCC) would coordinate the actions across the battlespace spectrum.⁵³ The flatter command structure allows the agile combat arms brigades to execute rapidly and defeat the enemy's decision cycle. Combat units would mass effects upon the enemy in a synergistic, objective oriented method not achievable under the unit/geographically-segmented battlefield.⁵⁴ Empowered with battlespace awareness combat arms brigades will allow the operational commander to reduce the need for geographically controlled areas of operations and foster greater efficiency in the employment of combat power. The cumulative effects of command-by-influence, hierarchy (headquarters) reduction, and the emergence of a functional JTF framework will foster the transition from a strategy of attrition to a strategy of shock.

Operational Protection

The inherent capabilities and deployment method of the combat arms brigades will assist the operational commander in fulfilling the function of operational protection. The commander seeks to protect the friendly forces in theater so that they can be employed at the decisive time and place.⁵⁵ The combat arms brigade will commence operations immediately upon arrival in theater, shortening or eliminating the vulnerable build-up phase. Lean, flexible ground combat units will disperse over a broad area, providing self-protection through

⁵¹ Macgregor, Command and Control for Joint Strategic Actions, 28.

⁵² Ibid., 28-30.

⁵³ Ibid., 29-30.

⁵⁴ Douglas E. Utley, "The Area of Operations: Fighting One Campaign," Joint Forces Quarterly, Autumn/Winter 1998-1999, 37.

⁵⁵ Milan Vego, On Operational Art (4th Draft), (Newport, RI: The United States Naval War College, September, 1999), 323.

maneuver/firepower and the ability to rapidly mass force. Force protection will incorporate both passive measures (dispersion) and active measures (maneuver and firepower).

The modular and specifically tailored logistic packages that will accompany the combat arms brigades will significantly reduce the battlespace signature produced by combat service support units.⁵⁶ The Third Wave concept of de-massification directly applies to military logistics. The ability to execute a strategy of shock and destroy decisive enemy targets with precision engagement enables the military to minimize the need for mass destruction (de-massified destruction).⁵⁷ The reduction in the task of munitions supply and transportation will afford greater force protection to future combat service support units. The integration of support elements within the combat arms brigade structure eliminates multiple headquarters echelons, dramatically reducing the vulnerable logistic footprint.

The Transition from Attrition to Entropy

The rapid decision cycle of the combat arms brigade coupled with the ability to execute dominant maneuver (precision maneuver and firepower) enables the operational commander to disregard the Information Age wars of attrition. Rather, the commander can direct American combat power against the cohesion of enemy units or states, creating organizational entropy.⁵⁸ Measured as a function of friction (friendly actions), disruption (enemy actions), and lethality (firepower directed at the enemy), the re-organized brigade is ideally qualified to accomplish this Information Age task.⁵⁹

The combat arms brigade will attack targets vital to an enemy's command and control, situational awareness, and communications. Destruction of these critical objectives will incapacitate unit organization and make the

⁵⁶ Joint Chiefs of Staff, Joint Vision 2010 (Washington, D.C.), 24.

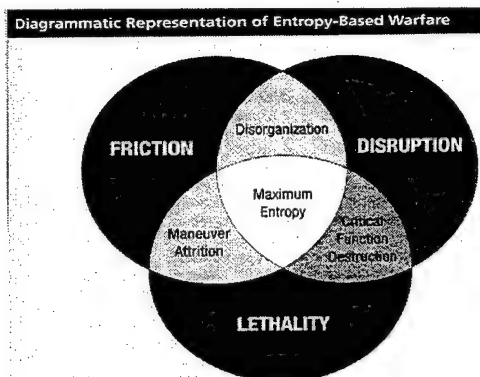
⁵⁷ Alvin Toffler and Heidi Toffler, War and Anti-War (Boston: Little, Brown and Company 1993), 83-84.

⁵⁸ Mark Herman, "Entropy-Based Warfare," Joint Forces Quarterly, Autumn/Winter 1998-1999, 86-87.

⁵⁹ *Ibid.*, 87.

enemy force incapable (figure-3) of coordinating combat potential.⁶⁰ The rapid decision cycle and dominant maneuver of the combat arms brigade allows the combatant commander to overwhelm the remaining enemy force through a superior operational tempo. The transition from attrition to entropy based warfare affords substantial opportunities in force protection, rapid conflict termination, reducing collateral damage, and reconstruction/post-hostility operations.

Figure-3
Entropy



The Vertical Continuum of War

The exponential growth in combat power within the combat arms brigade potentially effects the operational commander's vision of the vertical continuum of war. The JCS Doctrine for Joint Operations states, "[a]dvances in technology, information-age media reporting, and the compression of time-space relationships contribute to the growing interrelationships between the levels of war...However, commanders at every level must be aware that in a world of constant, immediate communications, any single event may cut across the three levels."⁶¹ The rapid decision cycle, dominant maneuver, and entropy producing capabilities of the combat arms brigade could potentially produce the event that extends across the continuum distinctions. The command-by-influence system that is the catalyst for the rapid decision cycle and operational tempo will also create a temptation by senior leaders (military and political) to move down the continuum.⁶² Operational commanders

⁶⁰ Ibid.

⁶¹ David Jablonsky, "U.S. Military Doctrine and the Revolution in Military Affairs," U.S. Army War College Parameters, Autumn 1994, 24.

⁶² Ibid., 28.

should be aware of the “continuum implications” on forces in the field and ensure that freedom of action is not negated.

The Spectrum of Conflict

The fall of the Berlin Wall has dramatically altered the range of military operations that American Army units must confront. Increasingly, Army soldiers are tasked to conduct military operations other than war (MOOTW), which broadly range from disaster relief to peace-enforcement, under hostile conditions. Confronted with the challenging range of military operations, the combat arms brigade provides the operational commander with a flexible and “full-spectrum” capable force. Due to finite resources, national leaders must conduct a prioritization of military capabilities. However, by establishing the parameters for the combat arms brigade to achieve victory in total war (command-by-influence, hierarchy reduction, and technology) does not necessarily imply that the construct is subject to failure within dissimilar environments. The characteristics that make the brigade an effective instrument in total war allow the unit to successfully transition to operations across the spectrum.

The current range of military operations has stretched the abilities of the Army’s capacity to respond in an adequate manner. Future adversaries and conflicts will expand the range of capabilities demanded to secure American interests. Renowned historian John Keegan recognizes the reemergence of the “warrior” society (Afghanistan, Somalia, and the Balkans) where the approach to warfare is radically different than that of Western culture.⁶³ “Streetfighter” nations will exploit asymmetric actions by incorporating mud-warfare (insurgency) and communications technology to brutally attack democratic nations.⁶⁴ Furthermore, growing international market in commercial technology could allow an adversary armed with superior equipment to challenge American forces.

⁶³ Charles J. Dunlap, Jr., “21st Century Land Warfare: Four Dangerous Myths,” U.S. Army War College Parameters, Autumn 1997, 28.

⁶⁴ *Ibid.*, 29-30.

The future range of military operations represents a varied and imposing challenge. Vice Admiral Charles Turner Joy stated 40 years ago: "[w]e cannot expect the enemy to oblige by planning his wars to suit our weapons; we must plan our weapons to fight war where, when, and how the enemy chooses."⁶⁵ The basic building block of the combat arms brigade, the self-synchronizing nature of the force will enable the 21st century unit to defeat the enemy across the spectrum of conflict, regardless of where, when, or how the enemy chooses to fight. The technology that supports dominant maneuver in total war may not provide the same degree of effectiveness in the mud-warfare environment. However, it will illuminate patterns of conflict in complex situations, enabling the operational commander to develop effective courses of action to counter the insurgent actions.⁶⁶ Command-by-influence, unit discipline, realistic training, and a lean organizational structure will ensure that the combat arms brigade will dominate the enemy's decision cycle and deny the adversary viable option sets in the "possibility space."⁶⁷ Although due to monetary constraints the combat arms brigades' equipment may have been designed for total war, the entrepreneurial adaptability of the unit coupled with battlespace awareness will allow the operational commander to achieve victory throughout the range of tomorrow's military operations.

Counterargument

As the debate within the United States Army focuses on the future structure of Force XXI, prudence should be taken to ensure that the art of warfighting retains the historic methods that have achieved success. While the private sector has experienced tremendous growth throughout the last decade, the catalyst was information technology rather than faddish decentralized management trends. The Army divisional model has proven to be an effective organizational system and offers utility for the challenging demands of the vast range of military operations. Information technology will enable senior commanders to dramatically reduce the environmental risks associated with critical decision-making executed with insufficient information. Rapid decision cycles will enable Army divisions to conduct dominant maneuver operations, overwhelming opposition forces.

⁶⁵ Ibid., 35.

⁶⁶ Martin C. Libicki, Illuminating Tomorrow's War (Washington: National Defense University Press 1999), 123.

⁶⁷ Barry D. Watts, Clausewitzian Friction and Future War (Washington: National Defense University Press 1996), 128-129.

The American Army must continue to execute centralized planning and decentralized execution. The commander's intent provides subordinate commanders with a solid endstate and encourages local initiative. However, a realistic approach to the complicated and ambiguous environment that the military services operate within dictates that senior commanders must retain strict operational control of subordinate units. Major General William Nash (US Forces, Bosnia) stated, "[i]f my Achilles heel is the low tolerance of the American people for casualties, then I have to recognize that my success or failure is directly affected by that."⁶⁸ Misconduct or mistakes by small units may have extreme political consequences, negating the positive achievements of the entire force.⁶⁹ The United States Army has a proven organizational structure and command and control system that when united with information technology will attain a historically, unprecedented increase in combat power.

The Industrial Age template perfected by the United States Army has served the nation well, providing deterrence during the Cold War and dominating the Gulf War battlefield. Lacking a military peer, it seems prudent to retain the command structure and organizational model from the past. Advanced sensors, platforms, and information systems incorporated within this proven model will ensure that America's Army remains globally superior. However, this stagnant, conservative approach to the dynamic changes of the Information Age threatens to render the Army obsolete. The Third Wave in civilization articulated by author Alvin Toffler predicts radical transformations in civilization within economics, politics, and society.⁷⁰ The enormous gains experienced in the private sector represent only the beginning of Information Age organizational and management changes that are capable of exponential increases in productivity.

To retain its relevance, the United States Army must shed the Cold War organizational structure and promote the combat arms brigade as the principal warfighting unit. Empowered with a command-by-influence system, subordinate leaders will execute military operations at a pace that was beyond the scope of Industrial Age

⁶⁸ Christopher M. Schnaubelt, "Lessons in Command and Control from the Los Angeles Riots," U.S. Army War College Parameters, Summer 1997, 106.

⁶⁹ Ibid.

⁷⁰ Alvin Toffler, The Third Wave, (New York: William Morrow and Company, Inc. 1980), 25-28.

forces. Advanced technology will provide robust capabilities, but the modern force multiplier will be innovative, decentralized decision making and rapid execution.

Furthermore, the growth of post-Newtonian theory, specifically nonlinearity, has begun to provide insight into the uncertainty and complexity of war. The Industrial Age encouraged the development of linear systems that would produce a predictable outcome. Technical advances are primarily linear and often centrally implemented to establish linear control and predict accurate systems outcomes.⁷¹ However, the principal deficiency of linearity is its inability to cope with interactions, such as the opposing will of an enemy force or the rapid expansion of friendly interactions (information technology) in the modern military.

Non-linearity is an inherent condition in the environment, manifesting within complex adaptive systems.⁷² Clausewitz recognized the nonlinear nature of war, stressing the impossibility, "to construct a model for the art of war that can serve as a scaffolding on which the commander can rely on for support at any time."⁷³ Acknowledging the dynamics of nonlinearity on the battlefield, the contemporary Force XXI model of linear command and control and "event quantification" (through the use of technology) fails to design a "secure scaffold" for the commander.⁷⁴ The failed American experience in Vietnam with centralization, quantification, and the promise of technology stands as a stark lesson to reexamine contemporary approaches to armed conflict. The modern commander is plagued with an infinite number of interactions and is unable to repeatedly execute sound decisions in this chaotic environment. In the quest for certainty on the battlefield, the 21st century Army must design an organization with the flexibility to conduct complex operations in a nonlinear environment. Placing decision thresholds at the local level and streamlining organizational hierarchies provides the

⁷¹ Tom Czerwinski, Coping with the Bounds: Speculations on Nonlinearity in Military Affairs (Washington: National Defense University Press 1998), 30-31.

⁷² Ibid., 13-14.

⁷³ Ibid., 200.

⁷⁴ Ibid., 157-158.

operational commander with an effective means of reducing nonlinear uncertainty. The force that can bring cause and effect closer together in space and time will seize victory on the battlefield of the future.⁷⁵

Conclusion

*"In the long run, the only sustainable source of competitive advantage is your organization's ability to learn faster than its competition."*⁷⁶ Peter Senge

The United States Army has entered a period of great transition. Technological advances hold the promise of significantly expanding force capabilities. However, the revolutionary changes that will mark the Information Age will be recognized in organizational structure and command and control practices. The American private sector has begun to shed its organizational "blindness" and has experienced the initial stage of dramatic expansions in productivity and competitive advantage. The Army must seize the "innovative high ground" and remove the institutional barriers to change.

Establishment of the combat arms brigade within the Army as the services premiere warfighting organization would greatly enhance the ability of the operational commander to decisively respond to events in the nonlinear battlespace. An expanded recognition of the commander's intent coupled with command-by-influence will assist the commander in coping with the uncertainty of multiple interactions in war. Lack of military innovation at this critical junction in history would threaten the relevancy of the force and place American interest in peril. The United States Army will break the Industrial Age command and control paradigm by applying the timeless adage, "you give up control, and you gain it."⁷⁷

⁷⁵ Ibid., 117.

⁷⁶ Peter M. Senge, The Fifth Discipline (New York: Currency Doubleday 1994), jacket.

⁷⁷ Czerwinski, Coping with the Bounds: Speculations on Nonlinearity in Military Affairs, 90.

BIBLIOGRAPHY

- Alberts, David S., John J. Garstka, and Frederick P. Stein. Network Centric Warfare: Developing and Leveraging Information Superiority. 2nd ed. Washington: NDU Press, 1999.
- Barnett, Sean D., and James S. Thomason. "Flexible Presence in the 21st Century." Joint Forces Quarterly, Autumn/Winter 1998-1999, 7-14.
- Bunker, Robert J. "Advanced Battlespace and Cybermaneuver Concepts: Implications for Force XXI." U.S. Army War College Parameters, Autumn 1996, 108-118.
- Czerwinski, Thomas J. "Command and Control at the Crossroads," Joint Forces Quarterly, Autumn 1996, 121-131.
- _____. Coping with the Bounds: Speculations on Nonlinearity in Military Affairs. Washington: National Defense University Press, 1998.
- Drucker, Peter F. Management Challenges for the 21st Century. New York: Harper Business, 1999.
- Dunlap, Charles J. Jr. "21st Century Land Warfare: Four Dangerous Myths." U.S. Army War College Parameters, Autumn 1997, 27-35.
- Franks, Frederick M. Jr., "Full-Dimensional Operations: A Doctrine for an Era of Change." U.S. Army Command and General Staff College Military Review, December 1993, 5-10.
- Harig, Paul T. "The Digital General: Reflections on Leadership in the Post-Information Age." U.S. Army War College Parameters, Autumn 1996, 133-140.
- Herman, Mark. "Entropy-Based Warfare." Joint Forces Quarterly, Autumn/Winter 1998-1999, 85-90.
- Howard, Michael, and Peter Paret. On War. Indexed ed. Princeton: Princeton University Press, 1989.
- Jablonsky, David. "U.S. Military Doctrine and the Revolution in Military Affairs." U.S. Army War College Parameters, Autumn 1994, 18-34.
- U.S. Joint Chiefs of Staff. Joint Vision 2010 Washington, D.C.
- Keithly, David M., and Stephen P. Ferris. "Auftragstaktik, of Directive Control, in Joint Combined Operations." U.S. Army War College Parameters, Autumn 1999, 118-132.
- Libicki, Martin C. Illuminating Tomorrow's War. Washington: National Defense University Press, 1999.
- Macgregor, Douglas A. "Command and Control for Joint Strategic Actions." Joint Forces Quarterly, Autumn/Winter 1998-1999, 25-33.
- _____. Breaking the Phalanx. Westport: Praeger, 1997.
- U.S. Joint Chiefs of Staff. National Military Strategy of the United States of America Washington, D.C.: September 1997.
- Reimer, Dennis J. "The Army After Next: Revolutionary Transformation." U.S. Army War College Parameters, Spring 1999, 41-44.
- Scales, Robert H. Jr. "A Sword with Two Edges: Maneuver in 21st Century Warfare." U.S. Army War College Parameters, Spring 1999, 45-54.

Schnaubelt, Christopher M. "Lessons in Command and Control from the Los Angeles Riots." U.S. Army War College Parameters, Summer 1997, 88-107.

Senge, Peter M., Art Kleiner, Charlotte Roberts, George Roth, and Rick Ross. The Dance of Change. New York: Currency Doubleday, 1999.

_____. The Fifth Discipline. New York: Currency Doubleday, 1994.

Singh, Ajay. "Time: The New Dimension in War." Joint Forces Quarterly, Winter 1995-1996, 56-61.

Sullivan, Gordon R., and Michael V. Harper. Hope is not a Method. New York: Broadway Books, 1996.

Toffler, Alvin. The Third Wave. New York: William Morrow and Company, Inc., 1980.

Toffler, Alvin, and Heidi Toffler. War and Anti-War. Boston: Little, Brown and Company, 1993.

Utley, Douglas E. "The Area of Operations: Fighting One Campaign." Joint Forces Quarterly, Autumn/Winter 1998-1999, 34-39.

Van Creveld, Martin L. Command in War. Cambridge: Harvard University Press, 1985.

Vego, Milan. On Operational Art (4th Draft). Newport, RI: The United States Naval War College, 1999.